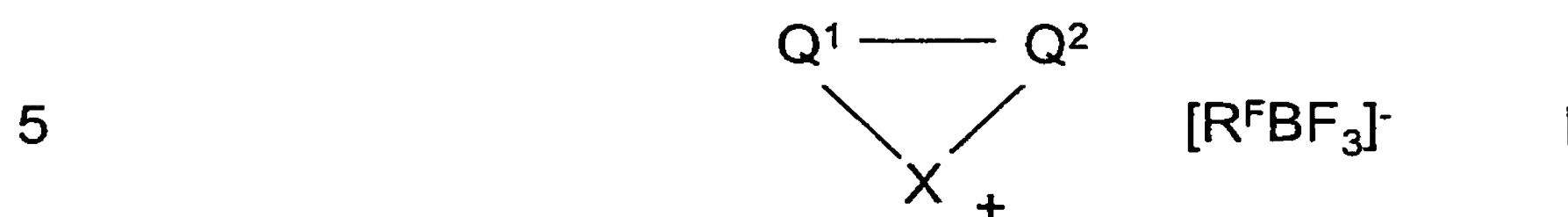


Patent Claims

1. Compounds of the formula I



in which

X denotes NR^1 or $N(R^1)_2$,

10 $-Q^1-Q^2-$ denotes $-CHR^3-CHR^4-CHR^5-CHR^6-$,
 $-CR^2=CR^3-CR^4=CR^5-CR^6=$ or
 $-CR^7=CR^8-NR^{10}-CR^9=$,

R^1 in each case, independently of one another, denotes alkyl having 1-10 C atoms or $-(CH_2)-R^{11}$,

R^2-R^6 denote hydrogen or alkyl having 1-10 C atoms,

15 R^7-R^9 denote hydrogen, alkyl having 1-10 C atoms or aryl,

R^{10} denotes alkyl having 2-8 C atoms or $-(CH_2)-R^{11}$,

R^{11} denotes perfluorinated or partially fluorinated alkyl having 1-8 C atoms,

20 R^F denotes perfluorinated alkyl having 2-8 C atoms, and

aryl denotes phenyl, perfluorinated phenyl, or phenyl or perfluorinated phenyl which is substituted by alkyl having 1-8 C atoms,

where the compounds

1-methyl-3-ethylimidazolium pentafluoroethyltrifluoroborate, 1-methyl-3-ethylimidazolium (n-heptafluoropropyl)trifluoroborate and 1-methyl-3-ethylimidazolium (n-nonafluorobutyl)trifluoroborate are excluded.

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2. Compounds according to Claim 1, characterised in that $-Q^1-Q^2-$ denotes $-CHR^3-CHR^4-CHR^5-CHR^6-$.

30 3. Compounds according to Claim 1 or 2, characterised in that the substituents R^1 are different.

4. Compounds according to Claim 1, characterised in that $-Q^1-Q^2-$ denotes $-CR^2=CR^3-CR^4=CR^5-CR^6=$.
5. Compounds according to Claim 1, characterised in that $-Q^1-Q^2-$ denotes $-CR^7=CR^8-NR^{10}-CR^9=$.
6. Compounds according to Claim 1 or 5, characterised in that the substituents R^1 and R^{10} in the formula I are different.
7. Compounds according to one or more of Claims 1 to 6, characterised in that R^F denotes perfluoroethyl, perfluoropropyl or perfluorobutyl.
8. Compounds according to Claim 1:
N-methyl-N-butylpyrrolidinium pentafluoroethyltrifluoroborate,
N-methyl-N-hexylpyrrolidinium pentafluoroethyltrifluoroborate,
N-methyl-N-octylpyrrolidinium pentafluoroethyltrifluoroborate,
1-methyl-3-butylimidazolium pentafluoroethyltrifluoroborate,
1-methyl-3-hexylimidazolium pentafluoroethyltrifluoroborate,
or 1,2-dimethyl-3-butylimidazolium pentafluoroethyltrifluoroborate.
9. Process for the preparation of compounds according to one or more of Claims 1 to 8, characterised in that
in the first step, a compound of the formula II
- $$(R^F)_3P=NSi(R^{12})_3 \quad II,$$
- in which
 R^F in each case, independently of one another, denotes perfluorinated alkyl having 2-8 C atoms, and
 R^{12} in each case, independently of one another, denotes alkyl having 1-8 C atoms, alkoxy having 1-8 C atoms, cycloalkyl having 3-7 C atoms, halogen or aryl,
- is reacted with a fluoride of the formula III

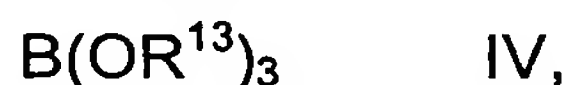


in which

M is ammonium, alkali metal or alkaline earth metal or a metal from group 11 or 12,

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and a boric acid ester of the formula IV

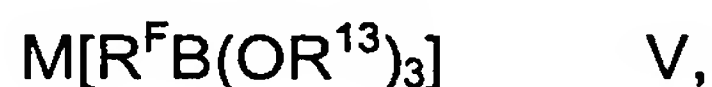


in which

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R^{13} in each case, independently of one another, denotes alkyl having 1-8 C atoms or aryl,

and the resultant salt of the formula V



in which M, R^{F} and R^{13} have one of the above-mentioned meanings, is reacted, in the second step, with HF,

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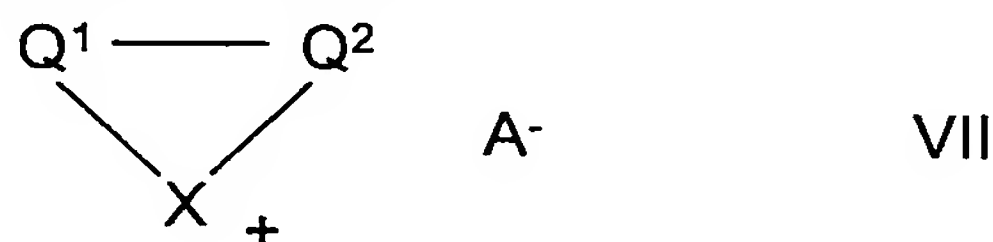
and the resultant salt of the formula VI



in which R^{F} is as defined above,

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is reacted, in the third step, with a compound of the formula VII



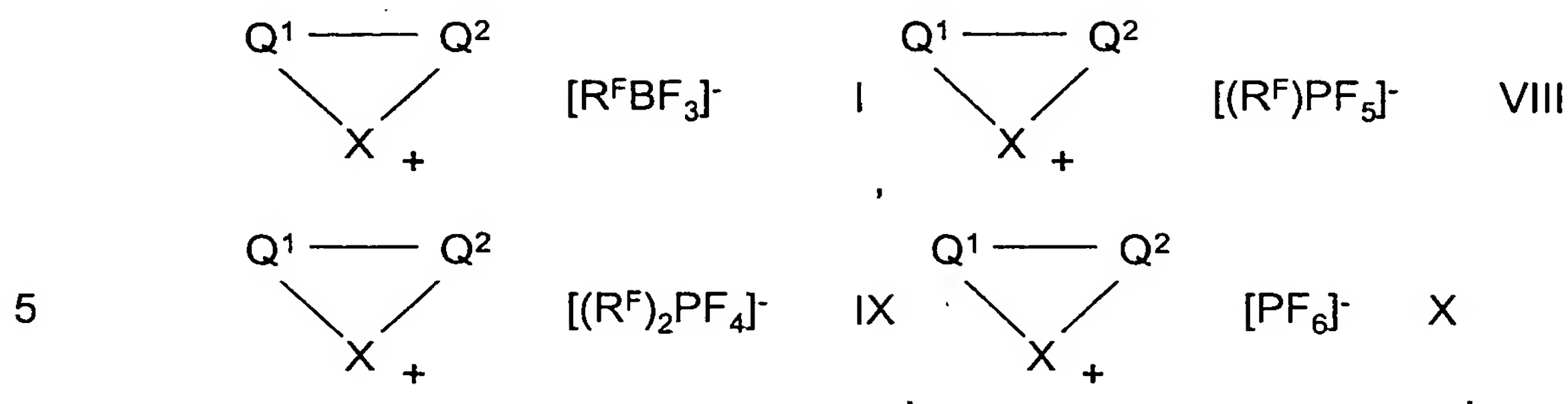
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in which X and $-\text{Q}^1-\text{Q}^2-$ are as defined for the formula I in Claims 1 to 6, and

A^- denotes alkylsulfate, alkylsulfonate, trifluoromethanesulfonate, tetrafluoroborate, acetate, trifluoroacetate, bis(perfluoroalkyl)phosphinate, F^- , HF_2^- , Cl^- , Br^- or I^- .

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10. Mixture of the salts of the formula I with salts of the formulae VIII, IX and X.



where

X, -Q¹-Q²- and R^F have the meaning indicated in Claim 1 or in Claims 2 to 7.

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11. Mixture according to Claim 10, characterised in that it comprises 50-75 mol% of compounds of the formula I and 25-50 mol% of compounds of the formulae VIII, IX and/or X, where X, -Q¹-Q²- and R^F have the meaning indicated in Claim 1 or in Claims 2 to 7.

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12. Use of the compounds according to one or more of Claims 1-8 as ionic liquids.

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13. Use of the mixture according to Claim 10 or 11 as ionic liquid.

14. Compounds of the formula II



in which

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R^F in each case, independently of one another, denotes perfluorinated alkyl having 1-8 C atoms, and

R¹² in each case, independently of one another, denotes alkyl having 1-8 C atoms, alkoxy having 1-8 C atoms, cycloalkyl having 3-7 C atoms, halogen or aryl.

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15. Compounds according to Claim 14, characterised in that R^F denotes perfluorinated C₁-C₄-alkyl.

16. Compounds according to Claim 14 or 15, characterised in that all three substituents R^F are identical.
- 5 17. Compounds according to one or more of Claims 14 to 16, characterised in that R^{12} in each case, independently of one another, denotes alkyl having 1-8 C atoms.
18. Use of the compounds of Claims 14 to 17 as alkylating reagents.

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